

CLAIMS

1. A diagnostic imaging apparatus comprising a main body freely held between one's fingers, a luminous means for irradiating at least one of lights selected from exciting light, infrared light and ultraviolet light, and an imaging means provided at a forward portion of said main body; wherein said imaging means comprises a solid-state image sensing device and an optical means for forming an optical image of a diagnostic object on said solid-state image sensing device; and wherein said imaging means receives the reflection light from said diagnostic object and/or the fluorescence of said diagnostic object to output a predetermined diagnostic image information when light is irradiated from said luminous means to said diagnostic object.
2. The diagnostic imaging apparatus as set forth in claim 1, wherein a luminous means for irradiating white light is further provided.
3. The diagnostic imaging apparatus as set forth in claim 1, wherein said forward portion comprises a detachable attachment constituting a part of said forward portion; and wherein said optical means and/or said luminous means is provided in said attachment.
4. A diagnostic imaging apparatus comprising a main body freely held between one's fingers, a luminous means for irradiating at least one of lights selected from exciting light, infrared light and ultraviolet light, and an imaging means provided at a forward portion of said main body; wherein said imaging means receives the light from said diagnostic object to output a predetermined diagnostic image information when light is irradiated from said luminous means to said diagnostic object; wherein said imaging means comprises a solid-state image sensing device and an optical means for forming an optical image of said diagnostic object on said solid-state image sensing device; and wherein said optical means includes a optical path changing means for changing the optical path from said diagnostic object.
5. The diagnostic imaging apparatus as set forth in claim 4, wherein said forward portion is capable of being separated into a head portion including said optical path changing means and a base portion including said solid-state image sensing device.

6. A diagnostic imaging apparatus comprising a main body freely held between one's fingers, a luminous means for irradiating at least one of lights selected from exciting light, infrared light, ultraviolet light, and white light, and an imaging means provided at a forward portion of said main body;

wherein said imaging means receives the light from said diagnostic object to output a predetermined diagnostic image information when light is irradiated from said luminous means to said diagnostic object;

wherein said imaging means comprises a solid-state image sensing device and an optical means for forming an optical image of a diagnostic object on said solid-state image sensing device;

wherein said optical means includes an optical path changing means for changing the optical path from said diagnostic object; and

wherein said forward portion is capable of being separated into a head portion including said optical path changing means and a base portion including said solid-state image sensing device.

7. A diagnostic imaging apparatus having a main body freely held between one's fingers, a luminous means for irradiating at least one of lights selected from exciting light, infrared light, ultraviolet light, and white light, and an imaging means provided at a forward portion of said main body;

wherein said imaging means receives the light from said diagnostic object to output a predetermined diagnostic image information when light is irradiated from said luminous means to said diagnostic object;

wherein said imaging means comprises a solid-state image sensing device and an optical means for forming an optical image of a diagnostic object on said solid-state image sensing device; and

wherein a light shielding hood is provided for rejecting the intrusion of external disturbance light at said forward portion through which irradiation light from said luminous means, and the reflection light from said diagnostic object communicate.

8. The diagnostic imaging apparatus as set forth in claim 7, wherein said forward portion is provided with a detachable attachment which forms a part of said forward portion and including said light entrance; and wherein said optical means and/or said luminous means is provided in said attachment.

9. The diagnostic imaging apparatus as set forth in claim 1, 3, 8, wherein said optical means is a light receiving filter.
10. The diagnostic imaging apparatus as set forth in any one of claims 1, 4, 6 or 7, wherein a light receiving filter for transmitting only a light with specific wavelength range is provided adjacent to a light receiving part of said imaging means.
11. The diagnostic imaging apparatus as set forth in any one of claims 1, 4, 6, or 7, wherein said luminous means comprises any one of LED, a laser oscillator, and a halogen lamp.
12. The diagnostic imaging apparatus as set forth in claim 11, wherein said LED and said laser oscillator are so constructed as to switch the wavelength of the emitting light.
13. The diagnostic imaging apparatus as set forth in claims 5 or 6, wherein said head portion of said forward portion is provided with said luminous means and/or a light receiving filter for transmitting only the light with specific wavelength range.
14. The diagnostic imaging apparatus as set forth in claims 1, 4, 6 or 7, wherein said optical means and/or said luminous means is provided at said forward portion.
15. The diagnostic imaging apparatus as set forth in claims 1, 4, or 6, wherein said luminous means is so constructed to be detachable to said forward portion.
16. The diagnostic imaging apparatus as set forth in claims 1, 4 or 6, wherein said optical means and the luminous means are integrated so as to be detachable to said forward portion.
17. The diagnostic imaging apparatus as set forth in claims 1, 4, 6 or 7, wherein said forward portion is so constructed as to be detachable to said main body.

18. The diagnostic imaging apparatus as set forth in claims 1, 4, 6 or 7, wherein said luminous means comprises a light emitting member and a radiation filter for transmitting only the light with specific wavelength range among the light emitted from said light emitting member, said radiation filter being provided adjacent to said light emitting member.
19. The diagnostic imaging apparatus as set forth in claim 7, wherein said optical means includes a optical path changing means for changing the optical path from said diagnostic object when the light is irradiated from said luminous means to said diagnostic object.
20. The diagnostic imaging apparatus as set forth in claim 19, wherein said forward portion is capable of being separated into a head portion including said optical path changing means and a base portion including said solid-state image sensing device.
21. The diagnostic imaging apparatus as set forth in claim 20, wherein said head portion of said forward portion is provided with a luminous means and/or a light receiving filter which passes only the light with specific wavelength range.
22. The diagnostic imaging apparatus as set forth in claims 5, 6 or 20, wherein said head portion is provided with said luminous means; wherein separation function at said forward portion is achieved by a coupling means by which said head portion and said base portion are detachable each other; and wherein an electric connection member for supplying electric power to said luminous means is interposed for said coupling means.
23. The diagnostic imaging apparatus as set forth in claim 10, wherein a filter detachable means detachable to said light receiving filter is provided in said forward portion of said main body.
24. The diagnostic imaging apparatus as set forth in claim 10, wherein a filter unit having plural kinds of light receiving filters is further provided in the forward portion of said main body via filter changing means, said filter changing means selectively and switchably positioning said light receiving filter at predetermined position.

25. The diagnostic imaging apparatus as set forth in claim 24, wherein said filter unit comprises said plural kinds of light receiving filters rotationally disposed around an axis which is parallel to/ or normal to an optical axis direction of said imaging means or said luminous means.
26. The diagnostic imaging apparatus as set forth in claim 25, wherein said switching means comprises a motor by which said filter unit is driven to be rotated around said axis and a switching control means for driving said motor and selectively and switchably positioning said light receiving filter at predetermined position on a filter switching signal.
27. The diagnostic imaging apparatus as set forth in claim 25, wherein said filter switching signal is synchronously controlled with an irradiation signal of said luminous means.
28. The diagnostic imaging apparatus as set forth in claims 1, 4, 6 or 7, wherein plural luminous means are provided around said light receiving member of said imaging means in a manner that said light receiving member is disposed its center.
29. The diagnostic imaging apparatus as set forth in claims 1, 4, 6 or 7, wherein said luminous means includes plural light emitting members for emitting light with different wavelength respectively; and wherein a radiation driving means for selectively driving one of said plural light emitting members or plural light emitting members.
30. The diagnostic imaging apparatus as set forth in claim 28, wherein said radiation driving means is constructed such that radiation driving for selectively operating said plural emitting member is achieved by way of time division control.
31. The diagnostic imaging apparatus as set forth in claim 29, wherein said filter switching signal as set forth in claims 26 or 27 is synchronous with an input signal of said radiation driving means and is controlled so as to be switched into a light receiving filter corresponding to a selected light emitting member.
32. The diagnostic imaging apparatus as set forth in claims 1, 4, 6 or 7, wherein an image storage means is provided in said main body, a

control box or a foot pedal so as to record and store the diagnostic image information formed by said imaging means as a static image.

33. The diagnostic imaging apparatus as set forth in claim 29, wherein said radiation driving means includes a light source selection switch provided in said main body, said control box, or said foot pedal.

34. The diagnostic imaging apparatus as set forth in claim 33, wherein said image storage means is provided with an automatic photography control means for executing a predetermined time sequence by manual operation of a photography switch to sequentially store and keep in a memory the diagnostic image formed by said imaging means each time irradiation light with different wavelength is selectively irradiated.

35. The diagnostic imaging apparatus as set forth in claim 31, wherein an image storage means is provided for said main body, a control box or a foot pedal for recording and storing the diagnostic image formed by said imaging means as a static image;

wherein said image storage means is provided with an automatic photography control means for executing a predetermined time sequence by manual operation of a photography switch to sequentially store and keep in a memory the diagnostic image formed by said imaging means each time irradiation light with different wavelength is selectively irradiated; and

wherein said filter switching signal is synchronous with irradiation of said luminous means selected in accordance with the photography sequence from the radiation source which is predetermined depending on the input signal from said photography switch, and switching of said light receiving filter corresponding to radiation of said luminous means following the photography sequence can be executed.

36. The diagnostic imaging apparatus as set forth in claim 7, wherein said luminous means, said optical means or said light shielding hood is detachably attached to said light entrance by itself, or at least two of them are detachably attached to said light entrance by combining and integrating themselves.

37. The diagnostic imaging apparatus as set forth in claim 7, wherein said light shielding hood is made of a soft elastic tubular member such

as rubber or the like.

38. The diagnostic imaging apparatus as set forth in claim 7, wherein said light shielding hood is made of a non-light-permeable material.

39. The diagnostic imaging apparatus as set forth in claims 36 or 37, wherein the inner wall of said light shielding hood has a light-reflecting surface.

40. The diagnostic imaging apparatus as set forth in claim 39, wherein said light-reflecting surface is mirror finished.

41. The diagnostic imaging apparatus as set forth in claims 1, 4, 6 or 7, wherein a power source and a radio transmitter are provided in said main body so as to transmit the diagnostic image information formed by said imaging means to an external receiving apparatus via cordless manner.

42. The diagnostic imaging apparatus as set forth in claims 1, 4, 6 or 7, wherein said luminous means includes a light emitting member for emitting the light with wavelength suitable for hardening photo-polymerization resin.

43. The diagnostic imaging apparatus as set forth in claim 10, wherein the wavelength of the light irradiated from said luminous means is $400\pm 30\text{nm}$ and said light receiving filter provided adjacent to said light receiving member of said imaging means is so constructed as to transmit only the light with wavelength over than 430nm.